

REMARKS

The Office Action of May 10, 2007 has been carefully considered. Claims 8-16 and 22 have been amended. Claims 1-7 and 17-21 have been canceled. Claims 23-33 have been added.

Claim 8 is rewritten to include the limitations of claim 1. Claims 9-16 are amended to depend from claim 8. Claim 22 is rewritten to include the limitations of claims 1 and 17.

New claims 23-27 correspond to canceled claims 2-6. New claim 28 corresponds to canceled claim 18. New claims 29-33 correspond to canceled claims 2-6. No new matter has been entered.

Claim 22 has been objected to as being improper. Claim 22 has been amended to incorporate the limitations of claims 1 and 17. Accordingly, claim 22 and dependent claims 23-28 are allowable over the prior art of record.

The previously presented claims 8-15 were rejected under 35 U.S.C. § 102 as being anticipated or under 35 U.S.C. § obvious in view of JP 2000243444 to Toriida et al. or JP 2000077096 to Kobayashi et al. Applicant submits that neither Toriida et al. nor Kobayashi et al. anticipate the amended claims 8-15 because neither Toriida et al. nor Kobayashi et al. disclose each and every element of any of these claims.

Toriida et al. disclose a non-aqueous electrolyte consisting of a non-aqueous solvent containing a compound of a cyanoethyl group and 2) an annular carbonate and/or chainlike carbonate electrolyte (salt) is dissolved in the non-aqueous solvent.

In contrast to the invention defined by the present claims, Toriida et al. do not teach or suggest a first solvent of a cyclic carbonate. The electrolyte of the present invention must include all the ingredients of 1) an electrolyte salt, 2) first non-aqueous solvent of cyclic carbonate and 3) second non-aqueous solvent of nitrile. Accordingly, the invention defined by the present claims is not anticipated by Toriida et al.

Kobayashi et al. disclose a lithium-ion cell (battery) made using a non-aqueous electrolyte containing 1) lithium salt electrolyte, 2) a non-aqueous of cyanoethyl compound, and 3) the electrolyte may also contain carbonate.

In contrast to the invention defined by the present claims, Kobayashi et al. do not teach or suggest a first solvent of a cyclic carbonate. Accordingly, the invention defined by the present

claims is not anticipated by Kobayashi et al.

Furthermore, Toriida et al. or Kobayashi et al. do not teach or suggest an electrolyte having high ionic conductivity at low temperature, lower freezing point, less weight loss at high temperature, higher boiling point, or higher flash point as defined by the present claims. In particular, the present invention claims an electrolyte having (a) very high ionic conductivity (Claims 8-10), (b) less weight loss at high temperature (Claims 11, 12), (c) freezing point of less than -60°C (Claim 13), (d) boiling point of higher than 120°C (Claim 14) and (e) flash point of higher than 60°C (Claim 15). As shown in Comparative Example CE-2 of the present application described in ¶ 0060 and ¶ 0061:

In this example, non-aqueous electrolyte Sample No. CE-2 was made with the same recipe as Sample No. E-2 but without the use of ethylene carbonate "EC" and diethyl carbonate "DEC", *i.e.* the resulting electrolyte is 1.2M LiBF_4 MPN with the presence of nitrile solvent alone. Two batteries were made using electrolyte Sample No. CE-2 in the same manner as described in Example 1. Cycle performance and impedance of the resulting batteries are set forth in Table 2 under the electrolyte Sample No. CE-2. As shown in the table both capacity and rate capability are zero. It is clear that batteries made using an electrolyte comprising nitrile alone could not be charged or discharged.

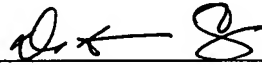
In the absence of a first solvent of cyclic carbonate, the electrolyte did not work for a lithium-ion battery. There is no teaching or suggestion in Toriida et al. or Kobayashi et al. of the feature of using a non-aqueous solvent of cyclic carbonate.

Applicant has achieved unexpected results by using the claimed electrolyte as shown in the Declaration of Luying Sun. The claimed electrolyte provides higher cycle (charge/discharge) efficiencies and higher capacity retention at temperatures of -10°C and -30°C for batteries made using the electrolyte of the present invention. Accordingly, the invention defined by the present claims is not obvious in view of Toriida et al. or Kobayashi et al.

In view of the foregoing, Applicant submits that all pending claims are in condition for allowance and request that all claims be allowed. The Examiner is invited to contact the undersigned should she believe that this would expedite prosecution of this application. It is believed that no fee is required. The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,

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